

CLAIMS

1. A booster comprising:

a booster circuit to which start-up energy necessary for starting up the booster circuit and operation energy necessary for continuing an operation of the booster circuit are supplied, wherein the booster circuit generates a boosted output obtained by boosting an input voltage as a target to be boosted; and

a power supply unit that supplies the start-up energy and the operation energy to the booster circuit.

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2. A booster comprising:

a booster circuit to which either one of start-up energy necessary for starting up the booster circuit and operation energy necessary for continuing an operation of the booster circuit is supplied, wherein the booster circuit generates a boosted output obtained by boosting an input voltage as a target to be boosted;

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a power supply unit that supplies the start-up energy; and

a selector circuit that outputs either one of the start-up energy and the operation energy to the booster circuit wherein

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the booster circuit outputs all or a part of the boosted output to the selector circuit as the operation energy.

3. The booster according to claim 2, wherein the selector circuit comprises:

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a first rectifier element connected to between the power supply

unit and the booster circuit; and

a second rectifier element that is normally connected in a direction in which all or a part of the boosted output is fed back to the booster circuit.

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4. The booster according to claim 2, further comprising:
an output controller circuit that is provided in a stage subsequent to the booster circuit and performs output control to the boosted output obtained from the booster circuit.

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5. The booster according to claim 4, wherein the booster circuit comprises:

a unit that controls an ability of boosting of the booster based on the output control by the output controller circuit.

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6. A booster comprising:

a booster circuit to which start-up energy necessary for starting up the booster circuit and operation energy necessary for continuing an operation of the booster circuit are supplied, wherein the booster circuit generates a boosted output obtained by boosting an input voltage as a target to be boosted; and

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a power supply unit that supplies the start-up energy to the booster circuit, wherein

the booster circuit feeds back all or a part of the boosted output as the operation energy to the booster circuit.

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7. The booster according to claim 6, wherein the booster circuit comprises an electric pathway between an output terminal of the booster circuit and the power supply unit.

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8. The booster according to claim 7, further comprising:
a rectifier element connected to between the output terminal of the booster circuit and the power supply unit in a forward direction.

10 9. A booster comprising:
a booster circuit to which either one of start-up energy necessary for starting up the booster circuit and operation energy necessary for continuing an operation of the booster circuit is supplied, wherein the booster circuit generates a boosted output obtained by
15 boosting an input voltage as a target to be boosted;
a power supply unit that supplies the start-up energy; and
a selector circuit that outputs either one of the start-up energy and the operation energy to the booster circuit, wherein
the booster circuit outputs all or a part of the boosted output to
20 the selector circuit and the power supply unit.

10. The booster according to claim 9, further comprising:
a rectifier element connected to between the booster circuit and the power supply unit in a forward direction.

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11. The booster according to claim 10, wherein the selector circuit further comprises:

a rectifier element connected to the booster circuit in a forward direction and in a direction in which the boosted output is fed back to
5 the booster circuit.

12. A booster comprising:

a booster circuit to which start-up energy necessary for starting up the booster circuit and operation energy necessary for continuing an
10 operation of the booster circuit are supplied, wherein the booster circuit generates a boosted output by boosting an input voltage, a target to be boosted, and outputs the boosted output; and

a storage element that stores the boosted output and generates a constant voltage output, and feeds back the constant voltage output
15 as the start-up energy and the operation energy to the booster circuit.

13. A booster comprising:

a booster circuit to which either start-up energy necessary for start starting up the booster circuit or operation energy necessary for
20 continuing an operation of the booster circuit is supplied, wherein the booster circuit generates a boosted output by boosting an input voltage, a target to be boosted, and outputs the boosted output; and

a storage element that stores the boosted output input through a rectifier element connected in a forward direction between the
25 booster circuit and the storage element and generates a constant

voltage output, and outputs the start-up energy; and

a selector circuit that outputs either the start-up energy or the operation energy to the booster circuit.

- 5 14. The booster according to claim 13, wherein the selector circuit further comprises:

a rectifier element connected in a direction in which the boosted output is fed back to the booster circuit itself and in a forward direction.

- 10 15. A booster comprising:

a booster circuit to which start-up energy necessary for starting up the booster circuit and operation energy necessary for continuing an operation of the booster circuit are supplied, wherein the booster circuit generates a boosted output obtained by boosting an input voltage,

- 15 target to be boosted;

a power supplying unit that supplies the start-up energy;

a switching unit that performs output control of the start-up energy, wherein

- 20 the booster circuit feeds back all or a part of the boosted output to the booster circuit as the operation energy and outputs the boosted output to the switching unit as a supply stop signal for the start-up energy, and

- 25 the switching unit performs control whether to output the start-up energy to the booster circuit based on a start-up signal based on power generation control of a low voltage output input as the target

to be boosted and the supply stop signal.

16. The booster according to claim 15, wherein the switching unit comprises:

5 a first switching element to which the start-up signal is input; and

a second switching element to which the supply stop signal is input and connected to the first switching element in series,

the switching unit causes the first switching element to be
10 conducting when the start-up signal is ON while interrupts the first switching element when the start-up signal is OFF, and

the switching unit causes the second switching element to be conducting when the start-up signal is ON while interrupts the second switching element when the start-up signal is OFF.

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17. A booster comprising:

a booster circuit to which either one of start-up energy necessary for starting up the booster circuit and operation energy necessary for continuing an operation of the booster circuit is supplied,

20 wherein the booster circuit generates a boosted output obtained by boosting an input voltage as a target to be boosted;

a power supplying unit that supplies the start-up energy;

a switching unit that performs output control of the start-up energy; and

25 a selector circuit that outputs either one of the start-up energy

and the operation energy to the booster circuit, wherein

the booster circuit outputs all or a part of the boosted output to the selector circuit and the power supplying unit;

the switching unit performs control whether to output the
5 start-up energy to the selector circuit based on a start-up signal based on power generation control of a low voltage output input as the target to be boosted.

18. The booster according to claim 17, further comprising:

10 a rectifier element connected between the booster circuit and the power supplying unit in a forward direction.

19. A booster comprising:

a booster circuit to which either one of start-up energy
15 necessary for starting up the booster circuit and operation energy necessary for continuing an operation of the booster circuit is supplied, wherein the booster circuit generates a boosted output obtained by boosting an input voltage as a target to be boosted;

a power supplying unit that supplies the start-up energy;
20 a switching unit that performs output control of the start-up energy;

a selector circuit that outputs either one of the start-up energy and the operation energy to the booster circuit; and

a signal delay circuit that generates a delay signal obtained by
25 delaying a power generation request signal sent for power generation

control of a low voltage output input as the target to be boosted by a predetermined time and outputs the delay signal, wherein

the booster circuit outputs all or a part of the boosted output to the selector circuit and the power supplying unit, and

5 the switching unit performs control whether to output the operation energy to the selector circuit based on the delay signal.

20. The booster according to claim 19, wherein the selector circuit comprises:

10 a first rectifier element connected between the storage element and the booster circuit; and

a first rectifier element that is connected in a direction in which all or a part of the boosted output is fed back to the booster circuit itself and in a forward direction.

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21. The booster according to claim 1, wherein the low voltage output that is the target to be boosted is supplied from a solar cell.

22. The booster according to claim 1, wherein the low voltage
20 output that is the target to be boosted is supplied from a fuel cell.

23. The booster according to claim 1, wherein the power supplying unit is a solar cell.

25 24. The booster according to claim 1, wherein the power supplying

unit is a lithium storage cell.

25. A booster comprising:

5 a booster circuit to which either one of start-up energy
necessary for starting up the booster circuit and operation energy
necessary for continuing an operation of the booster circuit is supplied,
wherein the booster circuit generates a boosted output obtained by
boosting an input voltage as a target to be boosted; and

10 an auxiliary booster circuit that outputs the start-up energy
generated based on the low voltage output to the booster circuit,
wherein

the booster circuit feeds back all or a part of the boosted output
to the booster circuit itself as the operation energy.

15 26. The booster according to claim 25, further comprising:

a unit that controls start-up of the auxiliary booster circuit based
on the boosted output.

27. The booster according to claim 26, further comprising:

20 an output controller circuit provided around the booster circuit
and performs output control to the boosted output obtained by the
booster circuit.

28. The booster according to claim 27, wherein the output controller

25 circuit includes a constant voltage element.

29. The booster according to claim 27, wherein the output controller circuit includes a constant voltage element and a constant current element.

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30. The booster according to claim 27, wherein the output control circuit controls boosting capability of the booster circuit.

31. The booster according to claim 27, wherein the output control
10 circuit performs time ratio modulation control to the booster circuit.

32. The booster according to claim 25, further comprising:
a power storing unit that stores all or a part of the boosted
output, wherein

15 the booster circuit feeds back a part of the boosted output to the
booster circuit itself as the operation energy and controls start-up of the
auxiliary booster circuit and the power storing unit based on the
boosted output, and

the selector circuit outputs to the booster circuit either one of
20 the start-up energy output from the auxiliary booster circuit and the
start-up energy output from the power storing unit.

33. The booster according to claim 32, wherein the selector circuit
comprises:

25 a first rectifier element connected between the auxiliary booster

circuit and the booster circuit in a forward direction; and

a second rectifier element that is connected in a direction in which all or a part of the boosted output is fed back to the booster circuit and in a forward direction.

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34. The booster according to claim 32, wherein a rectifier element is connected to between the booster circuit and the power storing unit in a forward direction.

10 35. The booster according to claim 25, further comprising:
a voltage judging unit that judges an output voltage of an auxiliary booster circuit output that is an output of the auxiliary booster circuit; and
a switching unit that switches supply/stop of the auxiliary
15 booster circuit output to the booster circuit based on a result of judgment by the voltage judging unit.

36. The booster according to claim 35, wherein the voltage judging unit comprises:

20 a comparator that compares the auxiliary booster circuit output with a predetermined standard voltage, wherein
a switching element included in the switching unit is controlled based on a result of comparison by the comparator.

25 37. The booster according to claim 35, wherein the voltage judging

unit includes Darlington-connected transistors that become conducting when the auxiliary booster circuit output reaches a predetermined voltage, wherein

5 a switching element included in the switching unit is controlled based on the auxiliary booster circuit output and a voltage drop that occurs between a base and an emitter of the Darlington-connected transistors.

38. The booster according to claim 25, wherein the auxiliary booster
10 circuit includes a switched capacitor type circuit.

39. The booster according to claim 25, wherein the auxiliary booster circuit includes a charged pump type circuit.